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Non Invasive Imaging (Echocardiography, Nuclear, PET, MR and CT)

EFFECT OF NITRIC OXIDE INHIBITION ON SKELETAL MUSCLE MICROVASCULAR FLOW IN ACUTE PERIPHERAL ARTERY THROMBOEMBOLISM TREATED WITH HIGH MECHANICAL INDEX PULSES AND SYSTEMIC MICROBUBBLES

Poster Contributions
Poster Hall B1
Monday, March 16, 2015, 9:45 a.m.-10:30 a.m.

Session Title: Non Invasive Imaging: Advances in Clinical Non-Invasive Imaging
Abstract Category: 17. Non Invasive Imaging: Echo
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Background: Although ultrasound induced inertial cavitation (IC) of microbubbles has dissolved microvascular thrombi in the setting of upstream arterial thromboembolism, it has also been shown to stimulate endogenous nitric oxide (NO) release, which may also improve blood flow in this setting. The purpose of this study was to determine the role of NO release in restoring microvascular blood volume (MBV) in acute thromboembolism.

Methods: Using a 1.7 MHz modified diagnostic ultrasound transducer (Philips S5-1), we quantified skeletal MBV changes in a rat hindlimb (n=16 rats) after microvascular obstruction was created by injecting <200 micron diameter thrombi into the common iliac artery.Occlusion was confirmed with low MI non-destructive imaging (NDI) at 0.2 MI during a continous intravenous infusion of 3% Definity microbubbles. Ten of the 16 rats then had a 10 minute treatment with intermittent IC inducing impulses from the same transducer, with four of these getting pre-treatment with an NO inhibitor (L-NAME). NDI imaging alone served as a control group (n=6).

Results: IC inducing impulses in the presence or absence of NO inhibitior produced improved MBV when compared to NDI alone (Graph), but the addition of L-NAME resulted in a lower recovered MBV when compared to IC impulses without L-NAME (p<0.01).

Conclusion: IC inducing impulses from a modified diagnostic transducer can improve MBV in acute arterial thromboembolism by both dissolving thrombi and improving NO production.